

## **Metric, Dimensional Analysis and Density Word Problems**

Conversions Factors			
1 hr = 60 min	1 min = 60 sec	1 ton = 2000 lbs	32oz = 1 quart
24 hrs = 1 day	1 kg = 2.2 lbs	1 gal = 3.79 L	264.2 gal = 1 cubic meter
1 mi = 5,280 ft	1 kg = 1000 g	1 lb = 16 oz	20 drops = 1 mL
365 days = 1 yr	52 weeks = 1 yr	2.54 cm = 1 in	1 L = 1000 mL
0.621 mi = 1.00 km	1 yd = 36 inches	1 cc is 1 cm <sup>3</sup>	1 mL = 1 cm <sup>3</sup>

1. Anthony was thirsty. He drank a glass of ice water and leaned against the door. He and Benjamin were going to the river near their school to look for gold. If he walked to Benjamin's house and then to the river, it would be five thousand, six hundred sixty-six meters. If he walked straight to the river, it would only be four kilometers. How many more meters does Anthony need to walk if he walks to Benjamin's house first instead of walking directly to the river?
2. A bomb exploded three and six tenths kilometers from the city. The explosion could be heard for as far as four and seven tenths kilometers from the center of the explosion. What is the furthest distance from the city that the bomb could be heard?
3. The naughty boy heard someone on television talking about how good a milk bath was for one's skin. He decided to try it. He went to the refrigerator and got out all the milk. The bathtub holds twenty-seven liters of liquid. If there are three liters of milk in each bottle, how many bottles will he have to use to fill up the bathtub?
4. The power went out during the storm. While the power was out, the temperature in Danielle's room dropped 0.2 degrees Celsius each hour. The temperate in the room was eighteen degrees Celsius when the power went off. The power came back on five hours later. What was the temperature in the room when the power came back on?
5. Brandon looked at the ten-liter jug of Gruesome Green soda sadly. He had bet his friend that he could drink all of it and now he was sure his stomach would explode if he drank one more milliliter. He had already drunk three thousand, seven hundred milliliters. How much was left in the jug?

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6. An irregularly shaped stone was lowered into a graduated cylinder holding a volume of water equal to 20.0mL. The height of the water rose to 30.2mL. If the mass of the stone was 25.0g, what was its density?
7. If two objects have the same density and **A** has a higher mass than **B**, which has a larger volume (A or B)?
8. If a person weighs 125 lbs, 8 oz., how many mg does s/he weigh?
9. Lake Michigan holds  $1.3 \times 10^{15}$  gallons of water. If just Chicago removed water from the lake and it never rained again, how many days would the water last? Chicago uses  $1.2 \times 10^9$  gallons of water /day
10. A glass bottle has a volume of 1L and weighs 500g. When half filled with oil, it weighs 1,750 g. What is the density of the oil in the bottle?
11. Find the mass of 250.0 mL of benzene. The density of benzene is 0.8765 g/mL.
12. How much bleach would you need to make a quart of 8 percent bleach solution (vol./ vol.)? Express your answer in fluid ounces.
13. Mercury metal is poured into a graduated cylinder that holds exactly 22.5 mL. The mercury used to fill the cylinder weighs 306.0 g. From this information, calculate the density of mercury.
14. A car consumes 25.00 gallons of fuel when driving a distance of 400.0 km. How many gallons will it consume when driving 250.0 miles?
15. A flask that weighs 345.8 g is filled with 225 mL of carbon tetrachloride. The weight of the flask and carbon tetrachloride is found to be 703.55 g. From this information, calculate the density of carbon tetrachloride.
16. Saffron costs \$368.00 per ounce. Determine how many grams you can purchase for \$15.00.

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